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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/579,050	03/13/2007	Jonathan J. Halls	29610/CDT471	7833

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EXAMINER	
MURATA, AUSTIN	
ART UNIT	PAPER NUMBER
1712	

NOTIFICATION DATE	DELIVERY MODE
02/08/2011	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/579,050	HALLS ET AL.	
	Examiner	Art Unit	
	AUSTIN MURATA	1712	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11/29/2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-10 and 12-29* is/are pending in the application.

4a) Of the above claim(s) *21* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-10,12-20 and 22-29* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *11/29/2010*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

The amendments filed 11/29/2010 have been entered and fully considered. Applicant asserts support can be found in the first full paragraph of page 9 and originally filed claims 2, 3 and 11. The examiner notes that the blend of polymer P1 (hole transporting) and copolymer of TFB (emissive and hole transporting) and F8 (emissive and electron transporting) supports the claim amendment.

Response to Arguments

Applicant argues BURROUGHES does not teach applying a composition that has both a material for transporting holes and a second material for emission and transporting holes and electrons. Applicant further points out that the composition is shown on page 17 of the disclosure as improving lifetime of the EL layer. The examiner respectfully points out that BURROUGHES teaches that the blends of materials used such as F8 and TFB can be combined chemically into a copolymer on **page 26** and **27**. Therefore the emissive layer has a material for emission and transporting holes and electrons. The examiner further notes there is no reason the first and second material of claim 1 cannot be the same material as the copolymer of F8 and TFB can be considered a first material for transporting holes and a second material for emission and transporting holes and electrons.

Applicant is advised that if the first and second materials are claimed as different materials, BURROUGHES teaches for example on page 28 using separate hole transporting layers and emissive layers. However it is known in the art to combine hole

transporting and emissive layers for example see KUNIGI et al. (US 2002/0042174) **[0042].**

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 3-10, 12-14, 16-18, 20 and 22-25 are rejected under 35 U.S.C. 102(b) as being anticipated by BURROUGHES (WO 99/48160).

Regarding claim 1,

BURROUGHES teaches an electroluminescent (EL) device that has a positive charge carrier injecting layer, a negative charge carrier injecting layer, and a light-emissive layer located between, that can also be positive or negative charge acceptors (material for transporting charge carriers) **page 5 line 7-17** and a semiconductor **page 7 lines 21-22**. More specifically, the reference teaches on **page 10 paragraph 3** a structure that includes a hole transport layer (first material for transporting charge carriers) followed by a light-emissive layer, followed by an electron transport layer (second material for transporting charge carriers) sandwiched between electrodes (cathode and anode). The reference teaches on **page 10 paragraph 2** that an electron transporting material can be F8 which is also light emitting (second material is also light emitting). The F8 can be blended with TFB as shown in Table 2 **page 20** where the

blend can optionally be made into a copolymer **page 26-27.** The first and second material is the same copolymer material.

Regarding claim 2,

BURROUGHES teaches on **page 2 middle paragraph** referring to **figure 1a** the first layer is an anode and the layer on the opposite side is the cathode. The first layer is positive charge carriers (holes) and the second injection layer has negative charge carriers (electrons).

Regarding claim 3,

BURROUGHES teaches on **page 10 line 3** the components of the EL layer are polymer.

Regarding claim 4 and 5,

BURROUGHES teaches on **page 10** and **figure 3** the polymer structures for one of the three materials (first material) in the EL layer as TFB. Specifically TFB from **figure 3** shows a repeat unit where the Ar pieces would be substituted substituted for aryl (phenyl) groups.

Regarding claim 6,

The structures in **figures 3 (page 10)** show a functional group (R) from the phenyl group below the nitrogen.

Regarding claim 7,

The structures of the repeat units in **figure 3 (page 10)** for TFMO and TFB both have only one nitrogen atom.

Regarding claims 8-10,

BURROUGHES teaches that another of the three materials (second material) is PFM shown in **figure 3 (page 10)**. The structure shows the Ar parts substituted for aryl groups. The structure shows each of the Ar as a phenyl group.

Regarding claim 11, 12 and 13

BURROUGHES teaches that it is known to deposit the hole transporting layer first (fabrication from anode to cathode) but also teaches that the first component deposited could be the negative electron transporting material **page 14 paragraph 3** (fabrication from cathode to anode) again using F8 shown in **figure 3** as the light emitting and electron transporting material.

Regarding claims 14 and 25,

Table 1 on **page 17** shows the emission color of the repeat units of **figure 3** being blue (475nm area of the spectrum).

Regarding claim 16-18,

BURROUGHES teaches in the **paragraph 2 on page 7** that the components of the light emissive layer are all soluble in the same solvent mixture for convenient co-deposition. The solvent used is xylene **paragraph 3 on page 28** (comprises poly-alkylated benzene).

Regarding claim 20,

BURROUGHES teaches the components of the light-emissive layer are phase separated, see **paragraph 5 on page 5**

Regarding claim 22,

BURROUGHES teaches the polymers can be partially conjugated, **paragraph 7 on page 12**.

Regarding claim 23 and 24,

BURROUGHES teaches on **page 10** using poly(2,7-(9,9-di-n-octylfluorene)) (a 9,9-disubstituted fluorine-2,7-diyl) which is F8 in **figure 3**.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 15, 19, and 26-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over BURROUGHES (WO 99/48160).

Regarding claims 15 and 26,

BURROUGHES teaches the materials of claim 1 **page 10** and teaches mixing them together **paragraph 2 page 7**. The reference does not teach using the particular material ratio claimed. However, **page 22** and **table 3** shows an efficiency change with varying ratios of material. At the time of the invention it would have been prima facie obvious to one of ordinary skill in the art to optimize the efficiency of the EL layer by changing the ratio of materials used (result effective variable). Therefore any ratio of material would raise a case of prima facie obviousness MPEP 2144.05 II.

Regarding claims 19 and 27-29,

BURROUGHES teaches that molecular weight is relevant for phase separation **Page 30 paragraph 2** but is silent to the molecular weights used. However, as a result effective variable, changing the molecular weight to different ranges is considered an optimization 2144.05 II and is not patentably distinct. At the time of the invention it would have been prima facie obvious to optimize the peak molecular weight of the material for the best phase separation.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to AUSTIN MURATA whose telephone number is (571)270-5596. The examiner can normally be reached on Monday through Friday 9:00-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, MICHAEL CLEVELAND can be reached on (571)272-1418. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/AUSTIN MURATA/

Examiner, Art Unit 1712
/Michael Kornakov/
Supervisory Patent Examiner, Art Unit 1714